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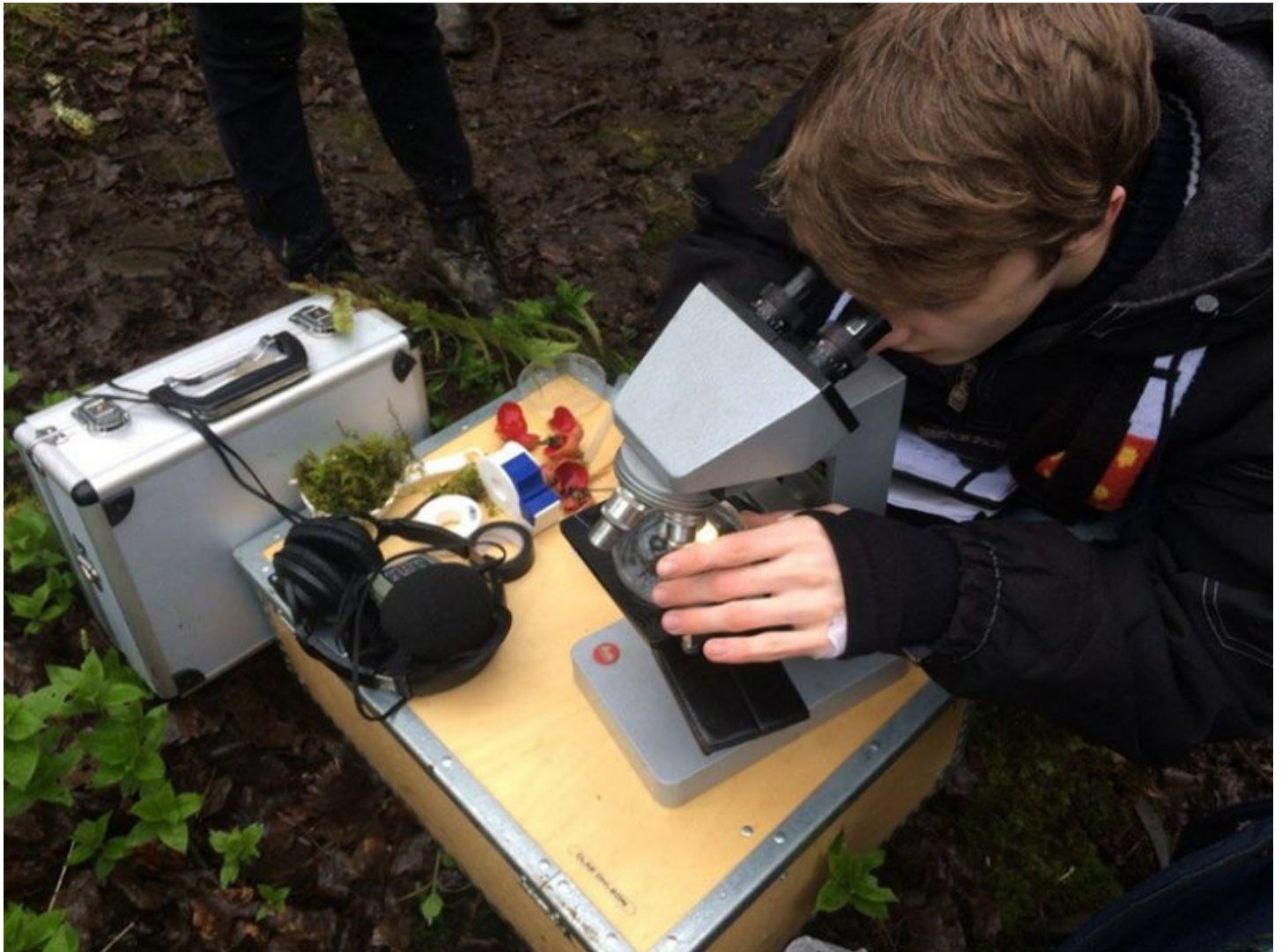
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SciArt: Teaching Across the Interface

A new program brings undergraduates together to collaborate across disciplines and to see their respective fields with new eyes.



An undergraduate art student from the Manchester School of Art uses a portable microscope to search for tardigrades in the Lancashire countryside. Credit: Ella Boston

By [Sam Illingworth](#) and Dave Griffiths 🕒 1 min ago

The science and art disciplines are usually treated as mutually exclusive entities, but they have much to offer each other. The burgeoning [SciArt movement](#)

(<https://www.forbes.com/sites/andrewgoldsmith/2018/07/23/the-sciart-movement-why-facebook-mit-and-autodesk-use-art-to-drive-innovation/#4db1c1f03911>), advocates for cooperative experimentation to generate mutual insights into process, experimentation, and analysis in both spheres.

These SciArt projects don't operate as the science of art or the art of science—instead, interdisciplinary investigations use the strengths and commonalities of both fields. In addition to

creating unique products and processes through such collaboration, introducing artists and scientists to one another as individuals can have a significant impact on the working practices of both groups.

To further develop these opportunities for cocreation, it is important to introduce scientists and artists to the potential of working together at an early point in their careers. To this end, Manchester Metropolitan University ([MMU](https://www2.mmu.ac.uk/) (<https://www2.mmu.ac.uk/>)) has launched several teaching programs that involve undergraduate and postgraduate students in science and art working together to create performances, experiments, and demonstrations.

We teach a cross-faculty unit called SciArt, bringing together M.Sc. students from the Faculty of Science and Engineering and M.A. students from the Manchester School of Art for a shared learning experience. This unique unit evolved over several years by synthesizing a number of interdisciplinary teaching projects. We present these experiences here as a model that others might wish to follow, and we are pleased to share our learning experiences and course materials.

Live Projects

As part of the 2014 [Manchester Science Festival](https://www.manchestersciencefestival.com/) (<https://www.manchestersciencefestival.com/>), four art and chemistry undergraduate students were paired up to create an interdisciplinary response to an external brief from a local museum centered around developing an exhibition piece that explored the intersections of science and art in the context of failure. The students explored their individual disciplines and interests to produce posters that were used during the university's welcome week to celebrate the potential for interdisciplinary collaboration.

We observed that the students developed new learning perspectives that helped them to reflect on their own approaches. For example, it quickly became apparent that art students were far more comfortable with embracing failure in their work than their scientific counterparts were; by working with art scholars, the science students were better able to grasp the importance of failure in developing their own scientific research. Further details of this project, including an exploration of the limitations of this approach, are given by *Illingworth et al.* [2016] and an example of the reflective blogs that were written by the students [can be read here](https://thefusionists.wordpress.com/) (<https://thefusionists.wordpress.com/>).

A Spectrum of Ideas

Following the success of these live projects, we were keen to increase the scope and offer this learning opportunity to more students. In the spring term of 2015, Spectrum was developed as an enrichment project that could be taken by both science and art undergraduate students. This unit featured lectures, workshops, and seminars delivered by staff from both faculties, as well as visits by SciArtist [Anthony Hall](http://www.antonyhall.net/) (<http://www.antonyhall.net/>) and Science Museum curator [Rachel Boon](https://twitter.com/rj_boon?lang=en) (https://twitter.com/rj_boon?lang=en).

Students were introduced to each other's working environments and got to operate in both art studios and science labs to gain exposure to each other's curiosities, methods, and social concerns. They worked on experiments together, which in turn generated new questions and knowledge that changed their learning habits and developed their practices. The 12-week course culminated in students curating an exhibition at Manchester Art Gallery (<http://manchesterartgallery.org/>), as part of the European City of Science (<https://www.manchester.ac.uk/discover/manchester/science/>), celebrations. This included an exploration of the infinite repetition of time and space, empathetic artificial intelligence (Figure 1), and even lab-cultivated bioluminescent bacteria.

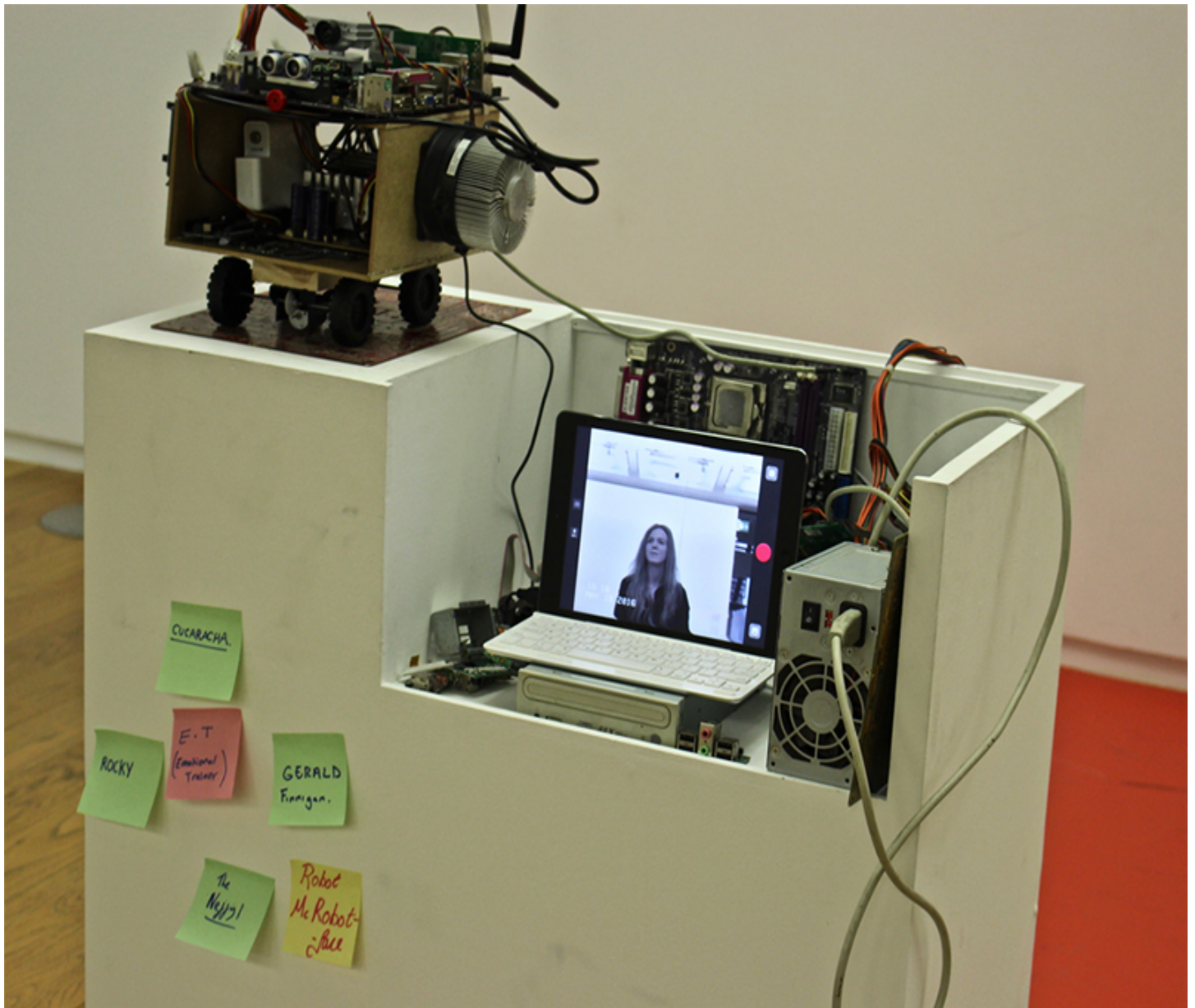


Fig. 1. *Emotional Training*, an interactive exhibition that asked participants to explore how technology could experience emotions, by Laura Armstrong, Ayah Alshami, Margherita Colucci, and Hannah Weston. Credit: Hanieh Hazrati

An Integrated Master's



Fig. 2. A collection of drawings from a workshop in which students were asked to consider the spatial scale of our universe from the parsec to the quantum. Credit: Dave Griffiths

Since autumn 2016, we have developed SciArt, a new unit for M.Sc. and M.A. students at MMU that synthesizes our learning from Spectrum and the live projects. Over 16 weeks, students attend lectures, seminars, and workshops to design critiques about the history and theory of the SciArt movement. Figure 2 shows the results from a drawing workshop in which students were asked to consider the spatial scale of our universe. They collaborate on artworks that are aesthetically and critically engaged with scientific phenomena and the social impact of new technology. The cohort is drawn from a diverse mix of university students in fine art, film, illustration, fashion design, and biomedical and environmental science.

The unit culminates in a public exhibition. Over the past 2 years, these events have been a great success, with a broad scope in both topic and design. The 2018 exhibition featured a board game about environmental science; a re-creation of L. S. Lowry's 1928 painting *Going to the Match* (<http://www.lowry.co.uk/lowry-signed-limited-edition-print-goingtothematch.html>) using wire, cotton, and shadow; and experiments in visualizing the International System of Units (SI) units of measurement (Figure 3). In keeping with the collaborative approach, we produced an accompanying zine (Figure 4) for visitors to the exhibition. Students are also expected to keep journals and blogs to both reflect on their accomplishments and identify new directions for future learning and practice.

Testing the Field

Alongside the SciArt unit, we continue to provide additional interdisciplinary learning experiences. For example, in March 2017, a mixed group of art and science students enjoyed a residential trip to a permaculture center (<http://www.middlewoodtrust.co.uk/>), organized by U.K. artist Annie Carpenter (<http://www.anniecarpenter.co.uk/>). Using poetry, ikebana (<https://www.nytimes.com/2017/11/06/t-magazine/ikebana-japanese-flower-art.html>), microscopes, and homemade hydrophones, the students worked together to explore their environment with new perspectives. In this case, we found that creating a climate in which there is no compulsory outcome is conducive to analytical development and that taking students outside of their usual comfort zones can create bonding experiences that lead to interesting creative outputs. Likewise, learning in an informal environment can help students avoid cognitive overload.



Fig. 3. A light installation by SciArt student Elizabeth Atherton that explores rationalized, precise understanding of the universe via the interplay between the seven SI base units of measurement.

Credit: Simon Davies

Symbiosis

Through formal feedback and internal surveys, the overwhelming majority of the students indicated that they have benefited from working in an interdisciplinary environment. Many selected these initiatives as the highlight of their degree program. We continue to stay in contact with several of these students, many of whom have continued to work collaboratively and have gone on to form their own collectives as a result. For example, a cohort of SciArt alumni curated their own exhibition for the 2018 Manchester Science Festival.



Fig. 4. A detail of the accompanying zine for the 2018 SciArt exhibition. Credit: Alice Thickett

This collaborative approach doesn't just provide benefits to the students—it has also greatly influenced our own practices, leading to collaborations that explore the symbiosis of our two disciplines. One of these projects, *Deep Field* [Unclear Zine] (<http://www.art.mmu.ac.uk/profile/dgriffiths/projectdetails/929>), was part of the *Perpetual Uncertainty* (<http://www.bildmuseet.umu.se/en/exhibition/perpetual-uncertainty/22269>) exhibition and also is the basis for a book chapter in *Field to Palette: Dialogues on Soil and Art in the Anthropocene* (<https://www.crcpress.com/Field-to-Palette-Dialogues-on-Soil-and-Art-in-the-Anthropocene/Toland-Noller-Wessolek/p/book/9781138297456>) [Toland et al., 2018] on how art might speak to the problem of deep-time geological nuclear waste disposal.

In the words of the great German polymath Johann Wolfgang von Goethe, “Science and art belong to the whole world, and the barriers of nationality vanish before them.” Through exploring the liminal spaces between both disciplines, artists and scientists can truly achieve greatness and empower society by demonstrating what can be gained through open and honest collaboration.

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